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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,198	12/15/2003	Xintian E. Lin	42339-198341	4797

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VENABLE LLP
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EXAMINER	
HAROON, ADEEL	
ART UNIT	**PAPER NUMBER**
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/734,198	LIN ET AL.	
	Examiner	Art Unit	
	Adeel Haroon	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-34* is/are pending in the application.

4a) Of the above claim(s) *31-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Amendment filed on date: 11/09/06. Claims 1-16 and 18-30 are still pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-16 and 18-30 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 7, 11-15, 19-21, 23, 25-27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. (U.S. 6,987,958) in view of Reudink (U.S. 5,757,318).

With respect to claim 1, Lo et al. disclose an apparatus with multiple antennas, element number 201, for connecting to receiver chains, element number 220, and to at least one transmitter chain, element number 215, in figure 2 (Column 3, lines 7-17). Lo et al. teach a switch, element number 210, adapted to couple each receiver chain to a selected beam during reception and the transmitter chain to a selected beam during transmission, so that each receiver chain is coupled to a different beam (Column 3, lines 7-17). Lo et al. further teach in figure 3 a first sub-switch adapted to couple a first beam to a first receiver chain creating a first signal path; a second sub-switch adapted to couple a second beam to a second signal path; and a third sub-switch adapted to couple a selected beam to the transmitter in element 215 creating a third signal path (Column 3, lines 18-51). Lo et al. differs from the applicant's claimed invention in that it uses an analog beamformer 205 and does not directly couple the antennas to the receiver chains and at least one transmitter. However, Reudink disclose an apparatus with multiple antennas connectable to receivers using a matrix switch 601 in figure 6. Reudink teaches using narrow beam antennas to connect to the receivers (Column 8, lines 38-53). Therefore, it would be obvious to one of ordinary skill in the art to use narrow beam antennas directly coupled to the receiver chains in the apparatus of Lo et al. instead of the analog beam former in order to "substantially reduce interference and provide increased antenna gain" (Reudink: Column 3, lines 53-56).

With respect to claim 2, Lo et al. disclose the switch works according to a predetermined criterion as controlled by the digital signal processor (Column 3, lines 18-40).

With respect to claim 3, Lo et al. disclose combining the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claims 4, 5, and 7, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claim 10, Lo et al.'s system has the capability of having a fourth sub-switch adapted to couple a third selected antenna to a third receiver chain (Column 3, lines 18-51).

With respect to claim 11, Lo et al. disclose a system with multiple antennas, element number 201, for connecting to receiver chains, element number 220, in figure 2 (Column 3, lines 7-17). Lo et al. teach a switch, element number 210, adapted to couple each receiver chain to a selected beam during reception so that each receiver chain is coupled to a different beam (Column 3, lines 7-17). Lo et al. further teach in figure 3 a first sub-switch adapted to couple a first beam to a first receiver chain creating a first signal path; a second sub-switch adapted to couple a second beam to a second signal path; and a third sub-switch adapted to couple a selected beam to the transmitter in element 215 creating a third signal path (Column 3, lines 18-51). Lo et al. differs from the applicant's claimed invention in that it uses an analog beamformer 205 and does not directly couple the antennas to the receiver chains and at least one transmitter. However, Reudink disclose an apparatus with multiple antennas connectable to receivers using a matrix switch 601 in figure 6. Reudink teaches using narrow beam antennas to connect to the receivers (Column 8, lines 38-53). Reudink also teaches using more antennas than receivers (Column 8, lines 38-53). Therefore, it would be

obvious to one of ordinary skill in the art to use narrow beam antennas directly coupled to the receiver chains in the apparatus of Lo et al. instead of the analog beam former in order to "substantially reduce interference and provide increased antenna gain" (Reudink: Column 3, lines 53-56).

With respect to claim 12, Lo et al. disclose a combiner, element number 230, to combine the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claim 13, Lo et al. disclose a demodulator, element number 240, to receive the combined signal and demodulate the combined signal (Column 3, lines 31-34).

With respect to claim 14, Lo et al. disclose the switch works according to a predetermined criterion as controlled by the digital signal processor (Column 3, lines 18-40).

With respect to claim 15, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claims 19 and 25, Lo et al. disclose a method that can be executed by a machine readable medium that determines a subset of beams out of a plurality of beams, using a predetermined criterion and switching signals from said (Column 3, lines 7-40). Lo et al. further teach in figure 3, switching signals from a first sub-switch adapted to couple a first beam to a first receiver chain; a second sub-switch adapted to couple a second beam to a second signal path; and a third sub-switch adapted to couple a selected beam to the transmitter in element 215 creating a third signal path (Column 3, lines 18-51). Lo et al. differs from the applicant's claimed

invention in that it uses an analog beamformer 205 and does not directly couple the antennas to the receiver chains and at least one transmitter. However, Reudink disclose an apparatus with multiple antennas connectable to receivers using a matrix switch 601 in figure 6. Reudink teaches using narrow beam antennas to connect to the receivers (Column 8, lines 38-53). Reudink also teaches using more antennas than receivers (Column 8, lines 38-53). Therefore, it would be obvious to one of ordinary skill in the art to use narrow beam antennas directly coupled to the receiver chains in the apparatus of Lo et al. instead of the analog beam former in order to "substantially reduce interference and provide increased antenna gain" (Reudink: Column 3, lines 53-56).

With respect to claims 20 and 26, Lo et al. disclose combining the outputs of the receiver chains (Column 3, lines 26-31).

With respect to claims 21 and 27, Lo et al. show in figure 3, that each receiver chain may receive signals from any one of the plurality of antennas (Column 3, lines 41-51).

With respect to claims 23 and 29, Lo et al. disclose switching a transmit power amplifier to be connected to any one of the plurality of antennas (Column 4, lines 12-23).

5. Claims 6, 22, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. and Reudink further in view of Evans et al. (U.S. 2003/0083016 as provided by applicant).

With respect to claim 6, the modified apparatus of Lo et al. and Reudink is described above in the discussion of claim 4. Lo et al. do not disclose that one sub-switch being adapted to be coupled to all except one of the plurality of antennas. However, Evans et al. disclose a switch system controlling diversity system thus making it analogous art since it is in the same field of endeavor. Evans et al. disclose a sub switch, which is coupled to all the plurality of antennas except one in figure 1 (Paragraph 16). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Evans et al.'s selective sub switch technique to the modified apparatus of Lo et al. and Reudink in order to provide the choice of the antenna with the best isolation.

With respect to claims 22 and 28, the modified method of Lo et al. and Reudink is described above in the discussion of claims 19 and 25. Lo et al. do not disclose that one sub-switch being adapted to be coupled to all except one of the plurality of antennas. However, Evans et al. disclose a switch system controlling diversity system thus making it analogous art since it is in the same field of endeavor. Evans et al. disclose a sub switch, which is coupled to all the plurality of antennas except one in figure 1 (Paragraph 16). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Evans et al.'s selective sub switch technique to the modified method of Lo et al. and Reudink in order to provide the choice of the antenna with the best isolation.

6. Claims 8, 9, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. and Reudink further in view of Nakamura (U.S. 6,243,563).

With respect to claim 8, the modified apparatus of Lo et al. and Reudink is described above in the discussion of claim 1. Lo et al. further disclose a transceiver, element number 215, that includes a power amplifier in the transmitter chain and also includes a receiver chain (Column 4, lines 12-23). There must be some element separating the transmitter and receiver chains, but Lo et al. do not specifically disclose a second switch. However, Nakamura disclose an apparatus with a plurality of antennas and a switch, element number 4, to separate the transmitter and receiver chain (Column 4, lines 17-35). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to include Nakamura's second switch in the apparatus of Lo et al. in order to provide a separator for the transmitter and receiver chains in the transceiver element.

With respect to claim 9, Lo et al. show in figure 3, that the sub-switches are coupled to all of the plurality of antennas (Column 3, lines 41-51).

With respect to claim 16, the modified system of Lo et al. and Reudink is described above in the discussion of claim 11. Lo et al. further disclose a transceiver, element number 215, that includes transmitter chain and also includes a receiver chain (Column 4, lines 12-23). There must be some element separating the transmitter and receiver chains, but Lo et al. do not specifically disclose a second switch. However, Nakamura disclose an apparatus with a plurality of antennas and a switch, element

number 4, to separate the transmitter and receiver chain (Column 4, lines 17-35). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to include Nakamura's second switch in the system of Lo et al. in order to provide a separator for the transmitter and receiver chains in the transceiver element.

7. Claims 18, 24, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lo et al. and Reudink in view of Ohkuba et al. (U.S. 2003/0003937).

With respect to claim 18, the modified system of Lo et al. and Reudink is described above in the discussion of claim 11. Lo et al. and Reudink are silent on the discussion of the second transceiver with which the system is communicating. However, Ohkuba et al. disclose a second transceiver, element number 11, which lacks diversity since it has only one antenna, element number 17, adapted to communicate with a first transceiver, element number 1, which employs antenna diversity in figure 1 (Paragraph 7 and 8). Since the first transceiver communicates with the second transceiver knowing that the first transceiver lacks antenna diversity, the first transceiver must communicate at a data rate accordingly. Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use the modified antenna selection technique in junction with Ohkuba et al.'s transceiver in order to reliably communicate with the second transceiver.

With respect to claim 24, and 30, the modified method of Lo et al. and Reudink is described above in the discussion of claim 19. Lo et al. and Reudink are silent on the discussion of the second transceiver with which the system is communicating. However, Ohkuba et al. disclose a system having diversity for reception and transmission in figure 1 and 5 (Paragraph 7 and 8). Also, since the base station communicates with the mobile station knowing that the mobile station lacks antenna diversity, the base station must communicate at a data rate accordingly. Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use the modified antenna selection technique of Lo et al. and Reudink in junction with Nakamura's base station in order "in order to reliably communicate with the second transceiver.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adeel Haroon whose telephone number is (571) 272-7405. The examiner can normally be reached on Monday thru Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AH
1/22/07

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